

REMARKS

Upon entry of the foregoing amendments, claims 26, 29 31-38, 40-44, 47-49, 51, 53, 55, 57, 58, 61-86 are pending in the application. Claims 26, 29, 31-33, 36-38, 40-44, 47, 48, 51, 57 and 58 have been amended. Claims 1-25, 27-28, 30, 39, 45, 46, 50, 52, 54, 56, 59 and 60 have been cancelled. New claims 62-86 have been added. Bases for the amendments can be found in the claims previously pending, as well as, page 3, paragraph, 1-3; page 7, paragraph 3; and page 5, paragraph 2; page 8, lines 1-2 and page 8, paragraph 2. The amendments and new claims do not introduce any new matter within the meaning of 35 U.S.C. §132, and the amendments are believed to place the claims in condition for allowance. Therefore, entry of the amendments is respectfully requested.

REJECTION UNDER 35 U.S.C. §112, second paragraph

Claim 39 has been rejected as indefinite due to the lack of antecedent basis for the phrase "optionally modified zirconium phosphate". Claim 39 has been cancelled, thereby removing the basis for this rejection.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

REJECTIONS UNDER 35 U.S.C. §102(b)GROT ET AL.

Claims 26-30, 32-36, 40, 57-61 are rejected as being unpatentable over Grot et al. (US 5,919,583). The substance of the rejection is put forth in the Office Action dated May 6, 2005 and is hereby incorporated by reference in its entirety.

Applicants respectfully traverse this rejection. Grot et al. fail to teach each and every limitation of the claims of the present application.

The instant claims are directed to an ion conducting composite direct methanol fuel cell membrane material of a polymeric matrix filled with oriented particles of layered type proton conducting zirconium phosphate and the methods of producing said membrane materials. According to the instant claims, the particles are presented in large and

small dies. Specifically, the method of preparation presently claimed is directed to composite proton conducting membranes containing a dispersion of pre-formed and very large planar particles of zirconium phosphate. As is evidenced by the Figures, a consistent increase of the length of the path of the diffusion species, and a reduction of methanol crossover, can only be obtained by utilization of large particles as presently claimed. Furthermore, the presently claimed membranes contain zirconium phosphate particles with a surface area larger than 10^6 nm^2 and thickness of about 10^2 nm and are prepared by the use of zirconium phosphate gels in organic solvent.

In contrast, Grot et al. teaches the zircon phosphate within membranes prepared by precipitating within a polymer solution. The use of zirconium phosphate gels in organic solvent is not taught. As such, there is no ability to influence the formation of large particles. Furthermore, the layered particles of the present application are not taught by Grot et al. As such, Grot et al. fail to teach each and every limitation of the claims of the present invention.

Accordingly, the Examiner is respectfully requested to reconsider and withdraw the outstanding rejection.

BONNET ET AL.

Claims 26-44 and 57, 58-61 are rejected as being unpatentable over Bonnet et al. J. New Mat. Electrochem. Systems, 3 (2000) 87-92. The substance of the rejection is

put forth in the Office Action dated May 6, 2005 and is hereby incorporated by reference in its entirety.

Applicants respectfully traverse this rejection. Grot et al. fail to teach each and every limitation of the claims of the present application.

Bonnet does not teach or disclose a particle size or thickness or the use of particles of different sizes as is presently claimed. Furthermore, Bonnet teaches preparation of the phosphates via precipitation, which as discussed above is not the subject of the present claims. Finally, it should be noted that the teaching of Bonnet are prophetic with respect to the probable outcome of transfer of the colloidal suspension in into a polymer solution. No data or experimental procedure is taught with respect to the actual result of such a procedure. As such, Bonnet et al. fail to teach each and every limitation of the claims of the instant application.

Accordingly, the Examiner is respectfully requested to reconsider and withdraw the outstanding rejection.

REJECTIONS UNDER 35 U.S.C. §103(a)

Claims 41-56 are rejected as being upatentable over Bonnet et al., above, in view of Alberti et al., J. of Colloidal and Interface Science, vol. 107, No. 1., 1983, pp 256-263. The substance of the rejection is put forth in

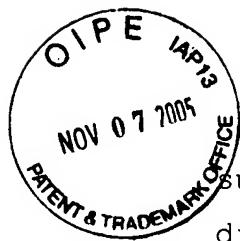
the Office Action dated May 6, 2005 and is hereby incorporated by reference in its entirety.

Applicants respectfully traverse this rejection. The references, alone and in combination fail to teach each and every limitation of the claims of the present application.

Bonnet et al. is discussed above, and said comments are incorporated herein by reference in their entirety. With respect to Alberti, it is respectfully noted that the procedure discussed therein relies on the addition of zirconium phosphate as pre-formed grinded micro-crystals to the polymeric matrix dissolved in organic solvent. The membrane was subsequently prepared by a casting procedure.

It would not have been obvious to one of skill in the art to take the teachings of Bonnet and Alberti, either alone or in combination and arrive at the presently claimed subject matter. Accordingly, the references do not teach each and every limitation of the presently claimed subject matter.

Accordingly, the Examiner is respectfully requested to reconsider and withdraw the outstanding rejection.



CONCLUSION

Based upon the above remarks, the presently claimed subject matter is believed to be novel and patentably distinguishable over the prior art of record. The Examiner is therefore respectfully requested to reconsider and withdraw the rejections. Favorable action with an early allowance of all claims pending in this application is earnestly solicited.

The Examiner is welcomed to telephone the undersigned attorney if he has any questions or comments.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "GARY M. NATH". It is written in a cursive style with some loops and variations in thickness.

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